

CLAIMS

1. Connector for piping destined to the transfer of fluid at very low temperature, in particular liquefied natural gas, comprising a first and a second length of piping (8, 9) provided with respective closing valves (20, 27) and destined to be fastened, respectively, to a piping (2) for the inflow of the fluid and to a piping (6) for the receiving of the fluid and a quick-coupling mechanism (34) mounted onto the second length of piping (9) and comprising a circumferential sequence of jaws (36) that are suitable to provide a firm front coupling between terminal flanges (12, 17) of the two lengths of piping (8, 9), and means (35 38) for the driving of the jaws, characterised in that each one of said lengths of piping (8, 9) is surrounded by an external coating band (23, 30) that defines with said lengths of piping a thermally insulating interspace (25, 32), the two coating bands (23, 30) being passed through by respective mechanisms (22, 29) for the transmission of the motion to said closing valves (20, 27) and the coating band (30) of the second length of piping (9) serving as a support for said quick-coupling mechanism (34).

2. Connector according to claim 1, characterised in that said terminal flanges (12, 17) are subdivided into an internal ring (13, 18) and into an external ring (14, 19) that are respectively fastened to an internal duct (10, 15) destined to the inflow of the fluid at very low temperature and to an external coaxial ducts (11, 16) destined to the passage of flow-back gas generated by thermal expansion of said fluid at very low temperature into the tank that receives it, and that the internal ring (18) of the terminal flange (12) of said length of piping (9) is subject to an elastically yielding axial thrust against the corresponding internal ring (13) of the terminal flange (12) of the other length of piping (8).

3. Connector according to claim 2, characterised in that said axial thrust is provided by a piston (40) housed inside a cylinder (42) and biased by a spring (41).

4. Connector according to claim 2, characterised in that the external rings (14, 19) of the terminal flanges (12, 17) of the two lengths of piping (8, 9) are provided with a circumferential sequence of double valves (43) made up of two axially lined up valves (44, 45) that when the connector is uncoupled are elastically maintained in closing position whereas when the connector is coupled they are automatically biased into an opening position from which they can be moved apart upon command for their return to closing position.

5. Connector according to claim 4, characterised in that one (45) of said two lined up valves (44, 45) is provided with a spacing bar (55) that is suitable to operate on the two lined up valves (44, 45) in order to force their opening when the terminal flanges (12, 17) of the two lengths of piping (8, 9) abut one against the other.

6. Connector according to claim 5, characterised in that it comprises a fluid-dynamic cylinder (60) with elastic return that can be activated so as to withdraw said valve (45) as regards the flange (17) that supports it, in such way so as to determine a distance between the two valves (44, 45) greater than the length of said spacing bar (55) and therefore to allow the movement of the two valves (44, 45) in closing position.

7. Connector according to claim 2, characterised in that said mechanisms (22, 29) for the transmission of the motion to said closing valves (20, 27) are made up of cardanic transmissions that are interposed between said closing valves (20, 27) and respective external driving organs (21, 28).

8. Connector according to claim 1, characterised in that said second length of piping (9) is provided with a cover (61) that is movable transversally to the axis of the connector (7) between an opening position and a closing position of the input mouth of the internal duct (15) of the aforesaid length of piping.

9. Connector according to claim 8, characterised in that said second

length of piping (9) is provided with additional covers (64) that are movable transversally to the axis of the connector (7) between an opening position and a closing position of respective valves (45) of said double valves (43).

5 10. Connector according to claim 2, characterised in that the internal duct (15) of the second length of piping (9) is connected with a duct (5) for the receiving of the fluid through an expansion joint (24) that allows to exert onto said internal duct (15) an axial thrust equal and opposite to the separation thrust that is exerted onto the internal ring (18) of the terminal flange (17) of the second length of piping (9) by the fluid during the transfer
10 stage.

 11. Connector according to claim 2, characterised in that it comprises elastic bellows (91, 92) associated with said rings (18, 19) of the terminal flange (17) of the second length of piping (9) in order to prevent infiltrations of water and humidity inside the second length of piping (9) when the
15 connector is coupled, while at the same time allowing limited axial movements of the aforesaid rings (18, 19).